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CASE AG/3-21900/AC 509

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

IN RE APPLICATION OF
SIMON ALEXANDER HANSON ROSE ET AL
APPLICATION NO: 09/361,816
FILED: July 27, 1999
FOR: PROCESS FOR IRRIGATION OF SOIL WITH WATER AND COMPOSITIONS WHICH PROVIDE FERTILIZATION AND SOIL STABILIZATION BENEFITS

Group Art Unit: 1616
Examiner: Sabiha Naim Qazi

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

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APPEAL BRIEF

Sir:

This appeal is from the final rejection mailed from the PTO on May 20, 2004.

The Notice of Appeal was mailed to the U.S. Patent and Trademark Office by first class mail with a Certificate of Mailing on September 20, 2004. The return receipt postcard accompanying the Notice of Appeal was date stamped in the PTO mail room September 23, 2004 making this Brief due November 23, 2004. A petition for a one month extension of time is attached herewith, extending the timely period for response up to and including December 23, 2004.

The Commissioner is authorized to charge any fee due, or credit any overcharge, as a result of this Amendment to Deposit Account No. 03-1935.

This Brief is timely filed.

(1) REAL PARTY OF INTEREST

The real party of interest is by virtue of an assignment recorded in the USPTO on November 12, 1999 on reel 010411, frame 0136:

Ciba Specialty Chemicals Water Treatments Ltd.
Cleckheaton Road
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Great Britain

(2) RELATED APPEALS AND INTERFERENCES

An Appeal Brief is also filed in Application number 10/057,423, filed January 24, 2002 of the same family. Application number 10/057,423 is also assigned to Ciba Specialty chemicals Water Treatments Ltd. The assignment was recorded on November 12, 1999 on reel 010411 frame 0136.

(3) STATUS OF THE CLAIMS

Claims 12-21 are pending. Claims 1-11 are cancelled. Claim 12-21 stand rejected and are argued upon Appeal.

(4) STATUS OF AMENDMENTS

Claim 12 was amended after Final Rejection but the amendment was not entered as Examiner alleged the amendment did not place the application in better form for appeal by materially reducing or simplifying the issues for appeal. Thus the claims presented in the amendment of January 30, 2004

are those argued on appeal. This brings up to date the status of the claims. A clean copy of the claims are attached in the Appendix.

(5) SUMMARY OF THE INVENTION

As taught on page 1, paragraph 1 of the disclosure, the present invention is to provide a process for fertilization and soil stabilization using compositions which are easy to handle using conventional fertilizer equipment. Also see page 3, paragraph 3.

The soil treatment process comprises adding an aqueous soil treatment composition consisting essentially of a water-soluble anionic polymer which has an intrinsic viscosity of from 9 to 12 dl/g and is formed from a water-soluble monomer or monomer blend and an ionic water-soluble fertilizer in an amount of at least 10 weight percent.

The water-soluble polymer is formed from 60 to 80% anionic monomer and from 40 to 20 wt. % nonionic monomer. See claim 12 and page 5, paragraph 1.

The ionic water-soluble fertilizer can be described as inorganic or urea-containing fertilizers. The fertilizer is present in a concentration of at least 10 wt. %. See page 5, last paragraph and continuing onto first paragraph of page 6. This composition (water-soluble polymer and ionic fertilizer) has a viscosity of not more than 4,000 cps. See claim 12 and page 6, paragraph 1. This composition is intended as a concentrate which is diluted and an area of soil is irrigated with the diluted composition. See page 6, paragraph 2. The aqueous soil treatment composition is suitable for being processed in dosing equipment which is in place for processing solutions of fertilizer alone. The diluted composition stabilizes and fertilizes the soil. See page 3, paragraph 3.

Preferred compositions of the ionic fertilizer and water-soluble polymer before dilution include a viscosity below 4000 cps, for example of 1,000 cps, or a viscosity of from 200 to 500 cps. See page 6, paragraph 1.

Preferred water-soluble anionic polymers are copolymers of acrylamide with an alkali metal salt of acrylic acid. See page 5, paragraph 5.

It is preferred that the polymer is added in solid form to the preformed solution of the fertilizer. See page 7, paragraph 5 and paragraph 7.

The process of soil treatment is suitable for irrigation processes including drip, furrow and spray irrigation. In particular the composition is suitable for use in processes of spray irrigation. This method of irrigation comprises pumping water through feed ducting and a mixing zone to a spray manifold supplying one or more spraying devices by which the water is sprayed onto the crop area to be irrigated, and the aqueous composiiton of the invention is metered directly into the water at or before the mixing zone. See page 6, last paragraph.

(6) ISSUES

The following issues are presented for review:

1. Whether claims 12-21 are properly rejected under 35 U.S.C. § 103(a) as being unpatentable over EP 586,911 and Sylling et al WO85/01938.

2. Whether claims 12-21 are properly rejected under 35 U.S.C. § 103(a) as being unpatentable over JP 51-124578.

(7) GROUPING OF THE CLAIMS

The following two groups of claims are argued separately for issue 1:

Claims 12,13 and 15-21 are argued together for issue 1.
Claim 14 is argued separately for issue 1.

Claims 12-21 stand and fall together for issue 2.

(8) ARGUMENT

Whether claims 12-21 are properly rejected under 35 U.S.C. § 103(a) as being unpatentable over EP 586,911 and Sylling et al WO85/01938.

Claims 12, 13 and 15-21 are argued together for issue 1.

Examiner alleges that the references teach polymeric soil improvement compositions, which embrace appellant's claimed invention. EP '911 teaches a composition for the treatment of soil containing an anionic fertilizer and an anionic polymer such as polyacrylamide and 97 to 0 mole percent of different water-soluble monomer or salts thereof. Prior art EP '911 teaches gel compositions and instant is aqueous composition. Prior art does not specify viscosity, which is instantly claimed. WO '938 teaches a composition for desalination of soils comprising anionic polymeric materials such as copolymers of acrylic acid, and methacrylic acid in aqueous compositions.

The Appellants respectfully disagree for the following reasons:

A. The Appellants believe EP '911 does not discloses or suggest the instant aqueous soil treatment compositions with the claimed viscosity.

B. Appellants further aver that Sylling should not be used in combination with EP '911 as it deals with soil desalination not soil fertilization.

C. And finally, Appellants will point out that the instant compositions do show unobvious results (low viscosity) not suggested in EP '911 or Sylling.

A. The Appellants believe EP '911 does not discloses or suggest the instant aqueous soil treatment compositions with the claimed viscosity.

The instant claims teach a soil treatment process comprising adding an aqueous soil treament composition consisting essentially of:

a) an ionic water-soluble fertilizer in an amount of at least 10 weight percent, and
b) a water-soluble anionic polymer which has intrinsic viscosity of from 9 to 12 dl/g and is formed from water-soluble monomer blend comprising 60 to 80 wt. % anionc monomer and from 40 to

20 wt. % nonionic monomer, the composition having a viscosity of not more than 4,000 cps, to water, the composition being thereby diluted, and irrigating an area of soil with the water.

The present composition requires particular anionic water-soluble polymers as part of the aqueous composition. See polymer b) above. The Examiner states that the viscosity of the present anionic water-soluble polymers is the same as that taught by EP '911 even though there are absolutely no examples within EP '911 which encompass the anionic polymers of the present claims. See page 4 of Office Action mailed on May 20, 2004 wherein the Examiner states that "a chemical compound and its properties for example viscosity, melting point, density etc. are inseparable to the compound." Thus the Examiner makes the inherency argument that the anionic polymers and nutrients of EP '911 are the same as those described by the instant. As they are alleged to be the same, they must have the same intrinsic viscosity. The suggestion of Sylling to use aqueous compositions thus, according to the Examiner completes the limitations of the present claims.

EP '911 does show compositions for treatment of soil containing anionic fertilizers and anionic polymers. EP '911 gives a very generic description on page 3, lines 38-45 of copolymers of acrylamide and acrylic acid and suggests ranges of 3 to 100 mole percent of acrylic monomer unit or salts thereof and from about 97 to 0 mole percent of different water-soluble monomer or salts thereof. Examples of polymers useful in the practice of EP '911 are polyacrylamide, copolymers of acrylamide and acrylic acid, polyacrylates, modified cellulose polymers, polysaccharides etc. This generic disclosure covers almost an infinite number of polymers.

EP '911 examples 1-7 show specific polymers of acrylamide and acrylic acid (examples 1-4 and 7), sodium acrylate and 2-acrylamido-2-methylpropane sulfate (example 5) and carboxymethyl cellulose (example 6).

Examples 1-4 and 7 are the only copolymer compositions containing acrylic acid and acrylamide and each of these examples is made from a 90 % acrylamide to 10 % acrylic acid ratio.

There is not one example of Appellants specifically claimed water-soluble anionic polymer (60 to 80 wt. % anionic monomer and from 40 to 20 wt. % nonionic monomer) making up the water-soluble copolymer in combination with ionic fertilizers.

There is no mention in EP '911 of the intrinsic viscosity of the water-soluble anionic polymer, nor is there any mention of the viscosity of the polymer/fertilizer combinations in EP '911. And yet the Examiner alleges that the anionic polymers of EP '911 inherently have the same viscosity as the Appellants anionic polymers.

As stated in *Ex. parte Schricker*, 56 USPQ 2d 1723, 1725 (B.P.A.I. 2000) (unpublished)

[T]he examiner talks in terms of inherency (which is really an anticipation rationale) while on the other hand the examiner talks in terms that it would have been obvious to experiment to divine optimum conditions.

Inherency and obviousness are somewhat like oil and water--they do not mix well. Claimed subject matter can be anticipated because a prior art reference describes a method which inherently meets the limitations of a claimed method. Claimed subject matter can be unpatentable for obviousness when, notwithstanding a difference between that subject matter and a prior art reference, the claimed subject matter, as a whole, would have been obvious. However, when an examiner relies on inherency, it is incumbent on the examiner to point to the "page and line" of the prior art which justifies an inherency theory. *Compare In re Rijckaert*, 9 F.3d 1531, 1533, 28 USPQ 2d 1955, 1957 (Fed. Cir. 1993) (when the PTO asserts that there is an explicit or implicit teaching or suggestion in the prior art, it must indicate where such a teaching or suggestion appears in the prior art) (citing *In re Yates*, 663 F.2d 1054, 1057, 211 USPQ 1149, 1151 (C.C.P.A. 1981).

There is no suggestion in the cited prior art that justifies this inherency theory. There are no examples of polymers in EP '911 encompassed by the present claims. There is no discussion in EP '911 as to viscosity and the importance of this characteristic in regard to the compositions disclosed in EP'911. The Appellants aver it would not be obvious to select from the vast array of potential anionic polymers suggested by EP '911 and then from this vast array of potential anionic polymers to furthermore select the particular monomer ratio claimed by the instant invention with the claimed range of intrinsic viscosities (9 to 12 dl/g) and combine with nutrient to achieve a composition viscosity of not more than 4,000 cps.

B. Appellants further aver that Sylling should not be used in combination with EP '911 as it deals with soil desalination not soil fertilization.

Sylling et al. WO 85/01938 describes a soil treatment composition which is an aqueous solution comprising organophosphorus acids and an anionic water-soluble low molecular weight polymer (page 5, lines 3 to 7). The low molecular weight anionics of Sylling are used as dispersants to drive high sodium and alkaline ions away from growth sites or deslaination of soils. See page 5, paragraph

3. The anionic of Sylling are not used to stabilize the soil as in EP '911 and are "not intended as a means of introducing fertilizers to crops." See page 7 lines 18-21.

In contrast, the anionic polymers in the compositions of the instant invention have molecular weights sufficiently high to give a soil stabilization effect not a low molecular weight material which would act as a dispersant. See page 4, paragraph 4 of Appellants disclosure. In further contrast the present water-soluble anionic is formed from 60 to 80 % anionic monomer and from 40 to 20 wt. % nonionic. It is not clear from Sylling what wt. % of the Belcene is hydrolysed or anionic.

Thus, Sylling relates to a different technical area and does not constitute relevant prior art. A person skilled in the art would not look to Sylling for aqueous compositions including ionic fertilizer. As explained above the anionic of Sylling is "not intended as a means of introducing fertilizers to crops."

It is well-settled that the mere fact that the prior art could be modified to form the invention would not make that modification obvious unless the prior art suggested the desirability of the modification. In re Laskowski, 10 U.S.P.Q. 2d 1397, 1398 (Fed. Cir. 1989); In re Gordon, 733 F.2d 900, 902, 221 U.S.P.Q. 1125, 1127 (Fed. Cir. 1984). It is submitted that the cited art does not teach or suggest the desirability of modifying EP '911 to incorporate aqueous systems of Sylling as the compositions of Sylling are used for desalination of soil and definitely not suitable for fertilization and soil stabilization.

C. And finally, Appellants will point out that the instant compositions do show unobvious results (low viscosity) not suggested in EP '911 or Sylling.

For clarity, the Appellants state that the invention is: a concentrated composition, which contains polymer and at least 10 wt. % fertilizer, has an extraordinary low viscosity. Neither Sylling nor EP '911 recognizes the low viscosity advantages of the inventive compositions comprising high anionic content (60 to 80%) with high fertilizer content (at least 10%) as will be explained below.

Appellants point to polymer B as a representative example in their specification for the invention they are claiming. Polymer B is formed from 65 wt. % anionic monomer and 35 wt. % nonionic monomer (page 11, first two lines). In example 1on page 10, compositions containing 2 wt. % of this polymer B and various fertilizers, namely urea ammonium nitrate (table 1, line 4, page 12), ammonium sulfate (table 1, line 7, page 12) and in example 2 on page 13, potassium chloride (table 2, line 5 and 6, page

14), show extremely low viscosities, namely 1510 cPs, 640 cPs, 350 and 375 cPs. In addition the compositions containing polymer B, and various fertilizers still show excellent soil stabilizing characteristics as can be seen by the flocculation values, which are 216.3 (measured in turbidity NTU , table 1, line 4, page 12), 285.3 (table 1 line 7, page 12), 240 (table 2, line 5, page 14) and 148 (table 2, line 6, page 14) . These NTU respective values are 28.5, 37.6, 37.2 and 22.9 percent of the flocculation value of the control (no polymer).

Compositions containing 2 w% of a polymer having an anionic monomer content outside the range of 60 to 80 w% and various fertilizers all, despite two exceptions, show viscosities above 3500 cPs (tables 1 and 2). The exceptions are the compositions containing polymer E (table 1, line 9, page 12) and polymer H (table 2, line 7, page 14), which show viscosities of 90 and 1250 cPs, respectively. The composition containing polymer E, however, does not show any soil stabilizing effect.

Appellants point out that polymer A (14.6 wt. % sodium acrylate and 85.4 wt. % acryalmide I) in table 1, page 12 is highly viscous showing a cps of 11,030. Also the low anionic composition polymers in table 2 also show very high viscosities. See polymers containing 14.24 % and 14.6 % anionics, lines 4, 11 and 14 in table 2, page 14 respectively. Each of these show extremely high viscosities (12,500, 8,625 and V. Viscous respectively). The polymers disclosed in EP '911 made up of 10 % anionics are more likely to be closer to the viscosity of these low anionic % than to those claimed by the Appellants.

The fact that only soil treatment compositions containing at least 10 w% fertilizer and a polymer having an anionic monomer content of 60 to 80 w% and a nonionic monomer content of 20 to 40 w% show exceptional low viscosities is an unexpected result, which could not be predicted by a skilled person. Therefore the claimed invention is unobvious.

A 103(a) rejection requires that there must be some suggestion or motivation, either in the references themselves or in the art, to modify or combine teachings. Furthermore, once combined, the prior art references must teach all of the claim limitations.

There is no suggestion within EP'911 or Sylling to combine the teachings of each to achieve the instant invention. EP' 911 is directed to a chemical grouting which prevents erosion and Sylling is directed to a chemical composition used to desalinate soil, not useful for delivering soil nutrients.

As EP '911 generic disclosure does not suggest selecting specific water-soluble anionics encompassed by the present invention (it would not have been obvious to experiment to divine optimum conditions), the combination of EP '911 water-soluble anionics and ionic nutrients with Sylling would give an aqueous composition of polymers (10% anionic and 90/% nonionic) not encompassed by the present invention. As all the limitations are not taught by the prior art references when combined, the 103(a) rejection is improper and the Appellants request reconsideration and withdrawal.

It is submitted that neither EP '911 or Sylling singly or together:

1. Teaches the inventive low viscosity water-soluble anionic copolymer composition of the instant invention.

2. And finally the combining of the two references is improper because the compositions of Sylling are not suitable for fertilization.

3. Neither reference recognizes the unexpected exemplified viscosity advantages of the particular anionic composition of the present invention shown in tables I and 2 of the instant specification.

Thus the 103 (a) rejections of claims 12, 13 and 15-21 based on EP '911 in view of Sylling are improper and Appellants aver that the rejection is addressed and successfully rebutted.

Claim 14 is argued separately for issue 1.

Claim 14 is of narrower scope than claim 12. Claim 14 is a process according to claim 12 in which water is pumped through feed ducting in a mixing zone to a spray manifold supplying one or more spraying devices by which the water is sprayed onto a crop area and the aqueous soil treatment composition is metered into the water at or before the mixing zone.

Thus the composition of claim 12 is metered into the water at or before the mixing zone. The unobvious low viscosity composition of claim 12 can be added directly to the dosing equipment in place for concentrated fertilizer solutions.

As stated previously, the compositions of EP '911 do not disclose the particular anionic polymers with nutrients of the instant invention.

Furthermore, EP '911 relates to a nutrient enhanced chemical grouting. See line 1, page 2. The polymer solutions and nutrients are subjected to a crosslinking reaction as the forming gel is applied to the ground surface. There is no suggestion to meter this forming gel into water in a mixing zone and spraying onto a crop area. In contrast to Appellants process, EP '911 pumps the polymer solutions from tanks in separate lines to a holding tank, where the solutions mix while being applied to the surface shoulder area along both sides of a road. See Example 8, page 12, first paragraph. The process of EP '911 requires two separate feed lines for the polymer solutions as well as a holding tank for running the crosslinking reaction. The gel is applied directly to the ground in order to accelerate revegetation of the treated area. See page 3, lines 17-19. There is no suggestion in EP '911 to meter the polymer and nutrient solutions directly into a water source and then spray the diluted water onto a crop area.

Nor does Sylling et al WO85/01938 suggest the metering of polymer and nutrient solutions directly into a water source and then spraying the diluted water onto a crop area. As explained above, the polymers of Sylling are not intended for use with fertilizer solutions. Thus a person skilled in the art would not look to Sylling for aqueous fertilizer compositions which are metered into an irrigation system. Thus the Appellants aver that the rejection is address and successfully rebutted.

Whether claims 12-21 are rejected under 35 USC 103(a) as being unpatentable over JP 51-124578.

JP 51-124578 discloses a soil treatment composition which is an aqueous solution comprising fertilizer and a water-soluble polymer consisting of 50 to 70 w% acrylamide and 30 to 50 w% potassium acrylate (page 2, third paragraph). This composition imparts to soil water-resistant aggregation ability and water-permeability as well as water retention property and is further useful as a fertilizer (page 1, third paragraph). It is usually diluted to a concentration of 1 to 10 w% fertilizer before being applied to the soil by appropriate methods such as spraying or dusting (page 3, second full paragraph). In example c) an aqueous solution comprising 11 w% fertilizer and 20 w% water-soluble polymer formed from 50 w% acrylamide and 50 w% acrylic acid is diluted by factor ten before being applied to sand soil.

The claimed composition differs from the composition disclosed in JP 51-124578 in that the instant contains a water-soluble polymer formed from 60 to 80 w% anionic monomer and 20 to 40 w% nonionic monomer. The advantage of this kind of polymer is discussed above (low viscosity when in a composition as in claim 1). The composition disclosed in JP 51-124578 can be diluted by water and then applied to the soil. However, it is not disclosed if this composition can also be added easily to irrigation water and thus is suitable for being processed using the dosing equipment which is in place for processing solutions of fertilizer alone. Based on the results presented in the present application the viscosity of the compositions disclosed in JP 51-124578 should be much higher than that of the claimed composition. Polymer L (42 anionic %) compositions show viscosities that vary from 5,975 and 6,150 cps in table 2. Polymer H (47 % anionic) shows some inconsistency from batch to batch. But clearly the compositions encompassed by the present invention, show dramatically lower viscosity than those encompassed by JP '578. Note that polymer B compositions show viscosities in the 300 cps ranges, as opposed to those compositions covered by JP '578 which show a cps that ranges from 1,250 to 9,000.

Therefore, as the inventive composition shows unexpected advantages (low viscosity with fertilizer) in light of tables 1 and 2 in the instant disclosure, the 103(a) rejection for JP '578 is addressed and successfully rebutted.

Appellants aver that these rejections are in error as outlined above and respectfully request that they be reversed.

Respectfully submitted,

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Attachments: Appendix with claims on appeal, Petition for one month extension.

(9) APPENDIX

The claims on appeal are:

1-11. **(cancelled)**

12. **(previously presented):** A soil treatment process comprising adding an aqueous soil treatment composition consisting essentially of:

(a) an ionic water-soluble fertilizer in an amount of at least 10 weight percent, and

(b) a water-soluble anionic polymer which has intrinsic viscosity of from 9 to 12 dl/g and is formed from water-soluble monomer blend comprising 60 to 80 wt.% anionic monomer and from 40 to 20 wt.% nonionic monomer, the composition having a viscosity of not more than 4,000 cps, to water, the composition being thereby diluted, and irrigating an area of soil with the water.

13. **(previously presented):** A process according to claim 12 in which the soil is irrigated by furrow irrigation, drip irrigation, or spray irrigation.

14. **(previously presented):** A process according to claim 12 in which water is pumped through feed ducting and a mixing zone to a spray manifold supplying one or more spraying devices by which the water is sprayed onto a crop area and the aqueous soil treatment composition is metered into the water at or before the mixing zone.

15. **(previously presented):** A method for the production of an aqueous soil treatment composition comprising providing an aqueous solution of at least 10 wt% ionic water soluble fertilizer (a) and mixing it with polymer (b), said polymer (b) being a water soluble anionic polymer which has an

intrinsic viscosity of from 9 to 12 dl/g and is formed from water-soluble monomer blend comprising 60 to 80 wt.% anionic monomer and from 40 to 20 wt.% nonionic monomer, the composition having a viscosity of not more than 4,000 cps, in powder form.

16. **(previously presented):** A soil treatment process as claimed in claim 12, wherein the composition has, before dilution, a viscosity below 4000 cPs.

17. **(previously presented):** A process according to claim 12 in which the polymer (b) is a copolymer of acrylamide with an alkali metal salt of acrylic acid.

18. **(previously presented):** A process according to claim 12 in which the polymer (b) is present in an amount of from 2 to 5 wt.%.

19. **(previously presented):** A process according to claim 12 in which the fertiliser (a) is present in an amount of from 20 to 60 wt.%.

20. **(previously presented):** A process according to claim 12 in which the aqueous soil treatment composition has a viscosity of from 200 to 500 cps.

21. **(previously presented):** A process according to claim 12 in which the aqueous soil treatment composition has a viscosity of not more than 1,000 cps.